TABLE OF CONTENTS

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1
- 1.1 Purpose and Need for Action 1-7
- 1.2 Regulatory Authority and Responsibility 1-8
- 1.3 Relationship to BLM Policies, Plans, and Programs 1-10
- 1.4 Conformance with Existing Land Use Plans 1-10
- 1.5 Consultation and Coordination 1-13

2.0 PROPOSED ACTION AND ALTERNATIVES 2-1
- 2.1 Proposed Action 2-3
- 2.2 Alternative 1 2-8
- 2.3 Alternative 2 2-8
- 2.4 Alternative 3 2-9
- 2.5 Alternatives Considered but Not Analyzed in Detail 2-10
  - 2.5.1 Alternative 4 2-10
  - 2.5.2 Alternative 5 2-11
  - 2.5.3 Alternative 6 2-12
- 2.6 Comparison of Alternatives 2-14

3.0 AFFECTED ENVIRONMENT 3-1
- 3.1 General Setting 3-1
- 3.2 Topography and Physiography 3-3
- 3.3 Geology 3-3
- 3.4 Soils 3-9
- 3.5 Air Quality 3-11
- 3.6 Water Resources 3-19
  - 3.6.1 Groundwater 3-19
  - 3.6.2 Surface Water 3-25
  - 3.6.3 Water Rights 3-27
- 3.7 Alluvial Valley Floors 3-28
- 3.8 Wetlands 3-29
- 3.9 Vegetation 3-30
- 3.10 Wildlife 3-32
  - 3.10.1 Wildlife Resources 3-32
  - 3.10.2 Big Game 3-33
  - 3.10.3 Other Mammals 3-34
  - 3.10.4 Raptors 3-34
  - 3.10.5 Game Birds 3-36
  - 3.10.6 Migratory Birds of High Federal Interest 3-36
  - 3.10.7 Other Species 3-38
  - 3.10.8 Threatened, Endangered and Candidate Animal Species 3-39

3.11 Ownership and Use of Land 3-39
3.12 Cultural Resources 3-49
3.13 Native American Consultation 3-51
3.14 Paleontological Resources 3-52
3.15 Visual Resources 3-53
3.16 Noise 3-54
3.17 Transportation Facilities 3-54
3.18 Socioeconomics 3-56
3.18.1 Population 3-56
3.18.2 Local Economy 3-56
3.18.3 Employment 3-58
3.18.4 Housing 3-58
3.18.5 Local Government Facilities and Services 3-59
3.18.6 Social Conditions 3-59
3.18.7 Environmental Justice 3-60
3.19 Hazardous and Solid Waste 3-61

4.0 ENVIRONMENTAL CONSEQUENCES 4-1
4.1 Direct and Indirect Impacts of Action Alternatives 4-3
4.1.1 Topography and Physiography 4-3
4.1.2 Geology and Minerals 4-4
4.1.3 Soils 4-7
4.1.4 Air Quality 4-8
4.1.5 Water Resources 4-13
4.1.6 Alluvial Valley Floors 4-18
4.1.7 Wetlands 4-19
4.1.8 Vegetation 4-20
4.1.9 Threatened, Endangered, and Candidate Plant Species 4-22
4.1.10 Wildlife 4-22
4.1.11 Threatened, Endangered, and Candidate Wildlife Species 4-25
4.1.12 Land Use and Recreation 4-26
4.1.13 Cultural Resources 4-27
4.1.14 Native American Concerns 4-27
4.1.15 Paleontological Resources 4-27
4.1.16 Visual Resources 4-28
4.1.17 Noise 4-28
4.1.18 Transportation Facilities 4-29
4.1.19 Socioeconomics 4-29
4.1.20 Hazardous and Solid Waste 4-31
4.2 No-Action Alternative 4-31
4.3 Regulatory Compliance, Mitigation, and Monitoring 4-31
4.4 Residual Impacts 4-37
4.4.1 Topography and Physiography 4-37

4.4.2 Geology and Minerals 4-37
4.4.3 Soils 4-37
4.4.4 Air Quality 4-37
4.4.5 Water Resources 4-38
4.4.6 Alluvial Valley Floors 4-38
4.4.7 Wetlands 4-38
4.4.8 Vegetation 4-38
4.4.9 Wildlife 4-38
4.4.10 Threatened, Endangered, and Candidate Species . . 4-38
4.4.11 Land Use and Recreation 4-38
4.4.12 Cultural Resources 4-38
4.4.13 Native American Concerns 4-38
4.4.14 Paleontological Resources 4-38
4.4.15 Visual Resources 4-38
4.4.16 Noise 4-39
4.4.17 Transportation Facilities 4-39
4.4.18 Socioeconomics 4-39
4.5 Cumulative Impacts 4-39
4.5.1 Topography and Physiography 4-48
4.5.2 Geology and Minerals 4-49
4.5.3 Soils 4-50
4.5.4 Air Quality 4-50
4.5.5 Water Resources 4-64
4.5.6 Alluvial Valley Floors 4-78
4.5.7 Wetlands 4-78
4.5.8 Vegetation 4-79
4.5.9 Wildlife 4-80
4.5.10 Threatened, Endangered, and Candidate Species . . 4-84
4.5.11 Land Use and Recreation 4-84
4.5.12 Cultural Resources 4-85
4.5.13 Native American Concerns 4-86
4.5.14 Paleontological Resources 4-86
4.5.15 Visual Resources 4-87
4.5.16 Noise 4-87
4.5.17 Transportation Facilities 4-87
4.5.18 Socioeconomics 4-88
4.6 The Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity 4-90
4.7 Irreversible and Irretrievable Commitments of Resources . . . 4-92

5.0 CONSULTATION AND COORDINATION 5-1

6.0 REFERENCES CITED 6-1

7.0 GLOSSARY 7-1

LIST OF FIGURES

Figure ES-1 General Location Map with Federal Coal Leases and LBA's . ES-2
Figure ES-2 General Analysis Area ES-3
Figure ES-3 Modeled and Extrapolated Worst-Case Coal Aquifer Drawdown Scenarios Showing Extent of Actual 15-Year Drawdowns and USGS Predicted Cumulative Drawdowns ES-18
Figure 1-1. General Location Map with Federal Coal Leases and LBA's . 1-2
Figure 1-2. Jacobs Ranch Mine Federal Coal Leases and the North Jacobs Ranch LBA Tract As Applied For 1-6
Figure 2-1. North Jacobs Ranch LBA Tract Configurations 2-2
Figure 3-1. General Analysis Area 3-2
Figure 3-2. North-South and East-West Geologic Cross Sections, North Jacobs Ranch LBA Tract 3-4
Figure 3-3. Stratigraphic Relationships and Hydrologic Characteristics of Upper Cretaceous, Lower Tertiary, and Recent Geologic Units, Powder River Basin, Wyoming 3-5
Figure 3-4. Wind Rose, Air Quality and Meteorological Stations at the Jacobs Ranch Mine 3-12
Figure 3-5. Average Annual View Impairment as a Function of Light Extinction 3-13
Figure 3-6. Coal Production and Overburden Removal vs. Ambient Particulates for Jacobs Ranch Mine 3-18
Figure 3-7. Monitoring Well Locations Within and Near the North Jacobs Ranch LBA Tract and Fort Union Formation Water Supply Well Locations at the Jacobs Ranch Mine 3-21
Figure 3-8. Surface Water Features Within and Adjacent to the North Jacobs Ranch LBA Tract 3-26
Figure 3-9. Raptor Nests Sites, Sage Grouse Leks, and Prairie Dog Towns Within and Adjacent to the North Jacobs Ranch LBA Tract . 3-35
Figure 3-10. Surface Ownership Within the North Jacobs Ranch LBA Tract 3-40
Figure 3-11. Oil and Gas Ownership on the North Jacobs Ranch LBA Tract 3-41
Figure 3-12. Transportation Facilities Within and Adjacent to the North Jacobs Ranch LBA Tract 3-44
Figure 3-13. CBM Wells, Pipelines, and Compressor Stations on the North Jacobs Ranch LBA Tract 3-45
Figure 3-14. Relationship Between A-Scale Decibel Readings and Sounds of Daily Life 3-55

Figure 4-1. Modeled Maximum PM_{10} and NO_x Concentrations at Jacobs Ranch Mine Permit Boundary, Year 2003 Worst-Case Scenario Resulting from 50 Million Tons Per Year of Coal Removal from Existing Leases 4-9
Figure 4-2. Life Of Mine Drawdown Map, Resulting from Proposed Action 4-16
Figure 4-3. Cumulative Air Quality Modeling Domain 4-54
Figure 4-4. Cumulative Pollutant Emissions from Mines and Other Sources 4-58
Figure 4-5. Cumulative Far-Field Concentrations 4-60
Figure 4-6. Cumulative Acid Deposition as Percent of Lower Limit of Acceptable Change 4-63
Figure 4-7. Modeled and Extrapolated Worst-Case Coal Aquifer Drawdown Scenarios Showing Extent of Actual 15-Year Drawdowns and USGS Predicted Cumulative Drawdowns 4-69
Figure 4-8. Life Of Mine Drawdown Map with Maximum Modeled CBM Drawdown Contours Superimposed 4-77

LIST OF TABLES

Table ES-1 Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for North Jacobs Ranch LBA Tract and Jacobs Ranch Mine ES-6
Table ES-2 Results of Air Quality Impact Analysis ($\mu g/m^3$) ES-16
Table ES-3 Predicted Annual Days of Visibility Reductions At Class I and Class II Sensitive Areas from Cumulative Sources . . . ES-17
Table 1-1. Leases Sold Since Decertification, Powder River Basin, Wyoming 1-4
Table 1-2 Pending LBA's, Powder River Basin, Wyoming. 1-5
Table 2-1. Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for North Jacobs Ranch LBA Tract and Jacobs Ranch Mine 2-15
Table 2-2. Summary Comparison of Magnitude and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract 2-16
Table 2-3. Summary Comparison of Magnitude and Duration of Cumulative Impacts 2-21
Table 3-1. Acres of Topsoil Available for Reclamation Within the North Jacobs Ranch LBA Tract Under the Proposed Action, Including the Area Added Under Alternative 2 and Lot 2 of Section 35, T.44N., R.70W. 3-11
Table 3-2. Regulated Air Emissions for Wyoming 3-14
Table 3-3. Maximum Allowable Increases for Prevention of Significant Deterioration of Air Quality: Particles 3-15

Table 3-4. Summary of WDEQ/AQD Report on Air Quality Monitoring in Wyoming's Powder River Basin, 1980-1988 3-17
Table 3-5. Annual Ambient NO_2 Concentration Data 3-20
Table 3-6. Vegetation Types Identified and Mapped Within the North Jacobs Ranch LBA Tract Baseline Study Area. 3-31
Table 3-7. MBHFI Status in Northeast Wyoming and Expected Occurrence on or near the North Jacobs Ranch LBA Tract . 3-37
Table 3-8. North Jacobs Ranch LBA Tract Oil and Gas Ownership . . . 3-42
Table 3-9. Sites and Isolated Finds in the Class III Cultural Resource Inventory of the North Jacobs Ranch LBA Tract and Buffer Zone 3-52
Table 3-10. Estimated 2000 Fiscal Revenues from 1999 Coal Production in Campbell County and Converse County 3-57
Table 4-1. Comparison of Existing and Proposed Jacobs Ranch Mine Disturbance Area and Mining Operations 4-2
Table 4-2. Comparison of Existing and Proposed Jacobs Ranch Mine Coal, Overburden, and Interburden Thicknesses 4-5
Table 4-3. Regulatory Compliance, Mitigation and Monitoring Measures required under the Proposed Action, Alternative 1 (No Action), Alternative 2, or Alternate 3 4-33
Table 4-4. Status of Wyoming Powder River Basin Coal Mines 4-41
Table 4-5. Coal Production and Development Levels, Campbell and Converse Counties, Wyoming 4-42
Table 4-6. Predicted and Actual Coal Mine Disturbance and Reclamation, Campbell and Converse Counties, Wyoming 4-47
Table 4-7. Cumulative Pollutant Emissions for Far-Range Air Quality/ AQRV Analysis 4-57
Table 4-8. Cumulative Far-Field Concentrations (percent of NAAQS) . . 4-59
Table 4-9. Predicted Annual Days of Visibility Reductions at Class I and Class II Sensitive Areas from Cumulative Sources 4-61
Table 4-10. Predicted Levels of Acid Deposition from Cumulative Sources Limit of Acceptable Change from 2.7 to 4.5 pounds/acres/ years) 4-62
Table 5-1. Other Federal, State, and Local Governmental Agencies Consulted in EIS Preparation. 5-2
Table 5-2. List of Preparers 5-3
Table 5-3. Distribution List 5-5

LIST OF APPENDICES

Appendix A. Federal and State Permitting Requirements and Agencies

Appendix B. Unsuitability Criteria for the North Jacobs Ranch LBA Tract

Appendix C. Coal Lease-by-Application Flow Chart

Appendix D. BLM Special Coal Lease Stipulations and Form 3400-12 Coal Lease

Appendix E. Non-Mine Groundwater and Surface Water Rights Within and Adjacent to the North Jacobs Ranch LBA Tract

Appendix F. Potential Health Effects from Release of Nitrogen Dioxide (NO_2)

Appendix G. Protection of Threatened and Endangered Species

Appendix H. Summary of the Air Quality Analysis within the Dakota, Minnesota & Eastern Railroad Corporation Powder River Basin Expansion Project EIS

Appendix I. Comment Letters on the Draft EIS and Responses